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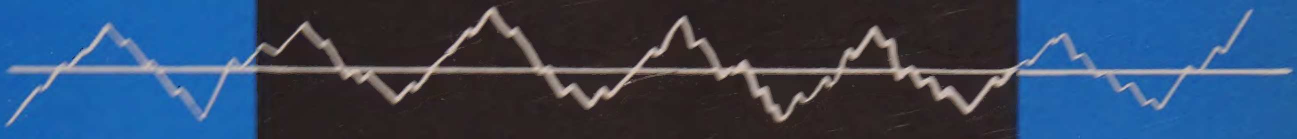

June 1959

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THE OFFICIAL BULLETIN OF THE FOUNDATION FOR THE STUDY OF CYCLES

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Director's Letter

Dear Member:

Fads and Fancies

"Why is it," Fred Feiker said to me once, "that a fad sweeps the country?"

"I can understand," he continued, "how some things could be suggested by, let us say, a nationally syndicated comic strip, but for other things the explanation is not so simple. Take the present [1931, this was] college boy fad of going without garters. A month or so ago everyone was wearing them. Now, as I go around the country all the boys are leaving them off, whether it is at Princeton or at the University of California. How can an idea of this sort get around the country so quickly? And why does it suddenly meet with such general acceptance?"

These were rhetorical questions. Mr. Feiker did not expect an answer. I did not know the answer then. I do not know it now.

A similar question was once asked me by C. A. Ilgenfritz, at the time tin buyer for the Republic Steel Company. "Why is it," asked Mr. Ilgenfritz, "that, suddenly, over night, all the tin brokers in New York, for no apparent reason, will turn bullish or bearish? It is as if they were in collusion, but I am sure that this is not so. It is more as if there were something in the air."

Synchronicity

All of this brings us to a concept first (as far as I know) presented to the Western world by C. G. Jung, the great psychiatrist, and labeled by him "synchronicity." This term is to be distinguished from "synchronous" which refers to happening at the same time. Synchronicity, in contrast, refers to *unrelated chance* events which fall into a pattern in time. For example, suppose that on a certain day your airplane ticket was number 3114, your lunch check was number 3114, and your theater ticket was number 3114. Each of these numbers was what it was purely by chance. The Western mind, limited by the concept of cause and effect, ascribes the coincidence to chance, too. To the Eastern or Oriental mind, or to the mystic, events of this sort suggest an underlying oneness of things which sometimes comes to the surface in this fashion.

Jung would doubtless include the garterless youths and the bullish tin brokers as examples of synchronicity—events, essentially random in themselves, which occur at the same time.

To the mystic or to the Eastern mind, coincidence can be meaningful even when there is no possible cause and effort or common cause possibility.

At the opposite extreme is the mind so constipated and constricted by the cause and effect idea, and so much a slave to it, that it cannot admit meaningfulness unless it *knows* the cause. If, for example, lynx abundance in Canada has a 7.95-year (secondary) cycle, and cotton prices have a 7.95-year cycle, the constipated mind says, "Cotton prices obviously cannot affect lynx abundance; lynx abundance obviously cannot affect cotton prices; their fluctuations obviously (sic) do not have a common cause; hence the two cycles have the same wave length merely by chance!"

To my mind a middle course is the right one. I would say, "It is unlikely that two phenomena would have cycles of the same wave length merely by chance. There is no apparent cause and effect relationship. Let us therefore look for a common cause. Or at least let us look for a single law of behavior to which both phenomena respond." (It is my fate generally to take the middle course, and to be dammed by Right and Left alike!)

I do not go as far as the mystic, nor do I want you to go as far. However, just as with a glove stretcher, one stretches a new glove *too* big, so that when it shrinks it will be comfortable, it may do no harm to present to you ideas beyond acceptance in order that you may accept ideas of normal, albeit somewhat unconventional, quality.

Cycles

All of this brings us back to garters and to tin prices. Garters—like games, which return to popularity at 7 year intervals—may be a bit hard to study, but tin prices should be easier. If these waves of optimism and pessimism come at reasonably regular time intervals they fall within the field of rhythmic cycles, and are fit objects for our investigation.

These changes in sentiment strike out of the blue with no logical forewarning. You remember the story of the man in San Francisco who left a broker's office—this was in 1929—to have his shoes shined. When he came back he found he had lost $40,000! I am sure there was nothing in the newspapers of that memorable September morning to warn him of the coming catastrophe. Nor will there be any forewarning of the next similar crash, except perhaps by a knowledge of cycles. Don't forget this!

Investment or Speculation

First of all, let me distinguish between investment and speculation . *Investment* is the placing of money for income. Speculation is buying something in the hope of an *advance in price*.

Obviously, in respect to stocks, we are in a *speculative* market at the present time. That is, people who buy stocks yielding let us say, 3%, in preference to government or good short term bonds yielding perhaps 4%, or mortgages yielding perhaps

5%, are doing so either in the hope that they can unload at a higher price, or that the stocks, in time, will be worth more.

Sometimes a speculative orgy will subside gradually, like a ground swell in mid ocean. Sometimes, as in 1835 or 1929 in stocks, or at the time of the bursting of the Mississippi Bubble or the so-called Tulip Craze in Holland, the market overreaches itself and comes crashing down like the same ground swell breaking on the beach.

The Market

It is not my province to try to forecast the market, except as cycles are involved, but it may not be out of order for me to ask a few questions for *you* to answer.

1. Should weight be given to the opinion of our British and European cousins that stock prices in the U. S. A. are fantastic? That is, are our friends across the water more detached and hence more objective than we are?

2. Is the trend line of the stock market as shown in the lead article in *Cycles* for April the correct one? If so, we are at a point above trend reached only twice in a century and a quarter. Does this indicate odds in favor of a decline? Or are we in a "new era," as was so loudly proclaimed and rumored in 1928 and 1929?

3. Is fear of inflation the cause of the present high price of stocks? (If so, why did not fear of inflation cause a similar advance in stocks in the greenback era of the 1860's when we also went off the gold standard?) If not, are the present prices a manifestation of mass psychology?

4. Does our present tax structure discourage sales and thus prevent stock prices from reaching their own levels gradually?

5. Are trust departments of banks—and some of them own *billions* of dollars worth of stock—prevented by policy from selling when stocks are too high? In other words, having said for years, "It's better to put your funds with us than with our savings department," can they now suddenly turn and say, "The time has come to go into fixed value securities?" Could this be one cause of abnormal prices?

6. Do investment advisors and services, if bearish, express their real opinions? Can they afford to? Will their clients let them?

7. Does the fact that bonds have turned down presage, as it has in the past, a down turn of stocks?

8. Does the failure of industrial production to maintain the growth rate of 1947-1953 offer any warning?

9. Should we attach any significance to the fact that the cycles so far isolated in the market called for a crest *in the annual averages* in 1956 and that this crest did come and—in the annual figures—has not yet been exceeded?

10. Will the new factors that have entered the picture—massive government spending, inflation, and the assumption by the government of responsibility for a perpetual boom—offset the effect of other factors that may be adverse? Or, as far as stocks are concerned, will they fail?

I do not know the answer to *any* of these questions. Not owning any stocks I do not have to! *But you do*!!!

Cordially yours,

Edward R. Dewey

Director

Research by Staff

RECENT TRENDS IN INDUSTRIAL PRODUCTION

BY E. R. DEWEY

In the Director's letter in this issue I called attention to the fact that since 1955 industrial production has not been increasing as fast as it had for the nine years prior to that date. I asked if this was a forewarning of a decline to come. I promised you an article on this subject.

On the next two pages there is a chart of industrial production from January 1947 through March 1959. This is the curve we print for you every month in the Geisinger Indicator. It represents the actual values of industrial production, as supplied by the Federal Reserve Board, smoothed slightly to reduce the month to month irregularities and to show basic structure more clearly. (The smoothing is done by a 3-month moving average.)

The latest actual monthly value of the F. R. B. Index (seasonally adjusted) is shown by the dot.

Post-War Trend

To this curve I have added a straight line (A,B) which touches the curve at February 1947, September 1950, and May 1953. It almost touches the curve at December 1947 also. This straight line shows the rate of advance over the 1947-1953 period. It has been projected at the same slope through 1960. The line moves upward at the rate of almost one-half an index point a month.

Parallel to this line, and 20 points below it, I have added another line (C,D). This second line goes through the industrial production curve at November 1949 and again at August 1954.

These two lines (A,B and C,D) form the *channel* within which industrial production varied during the period , 1947-1954. They define the upper and lower limits beyond which production did not go.

If nothing had happened to change the behavior pattern of these eight years we could have expected future peaks and troughs to fall within these limits. At least that is the way the quality control engineer would look at it.

But something new *did* enter the picture. (A downward cyclic force?) The peak of 1955 failed to reach the line A,B by 7½ points; the peak of 1956 failed to reach the line A,B by 10½ points (getting worse!). The bounce back from the recession of 1953 did not have the same force as the bounce from the 1949 dip.

Moreover, in its downward 1957-58 thrust, the curve representing industrial production cut the line C,D in October of 1957. The low of 1958 was 18 points below the lower envelope line C,D (worse and worse!)

(This reminds me of a sign I once saw in South Dakota. The sign said "When in —— stop at the Worst Hotel." I had thought that nothing could be worse than the hotel I had stopped at the preceding night, but I suppose I was wrong.)

The three turning points, the peaks of 1955 and 1956 and the low of 1958, established a new trend.

To see the present situation more clearly refer to the chart in the lower right hand corner. In this chart the solid line shows industrial production January 1955 to date. It merely repeats the curve of industrial production shown in the upper chart.

Current Trend

The new trend is shown by the broken envelope lines E,F and G,H. These two trend lines are going up at .25 points a month. This is just half of the .49 points a month by which A,B and C,D advanced. Something, which came to a head in 1955, took exactly half the steam out of the boom (but half of it is seemingly still there).

The lower limit line of the new channel is more than 20 points below the upper limit line. In other words the channel is now slightly wider than the previous and steeper channel.

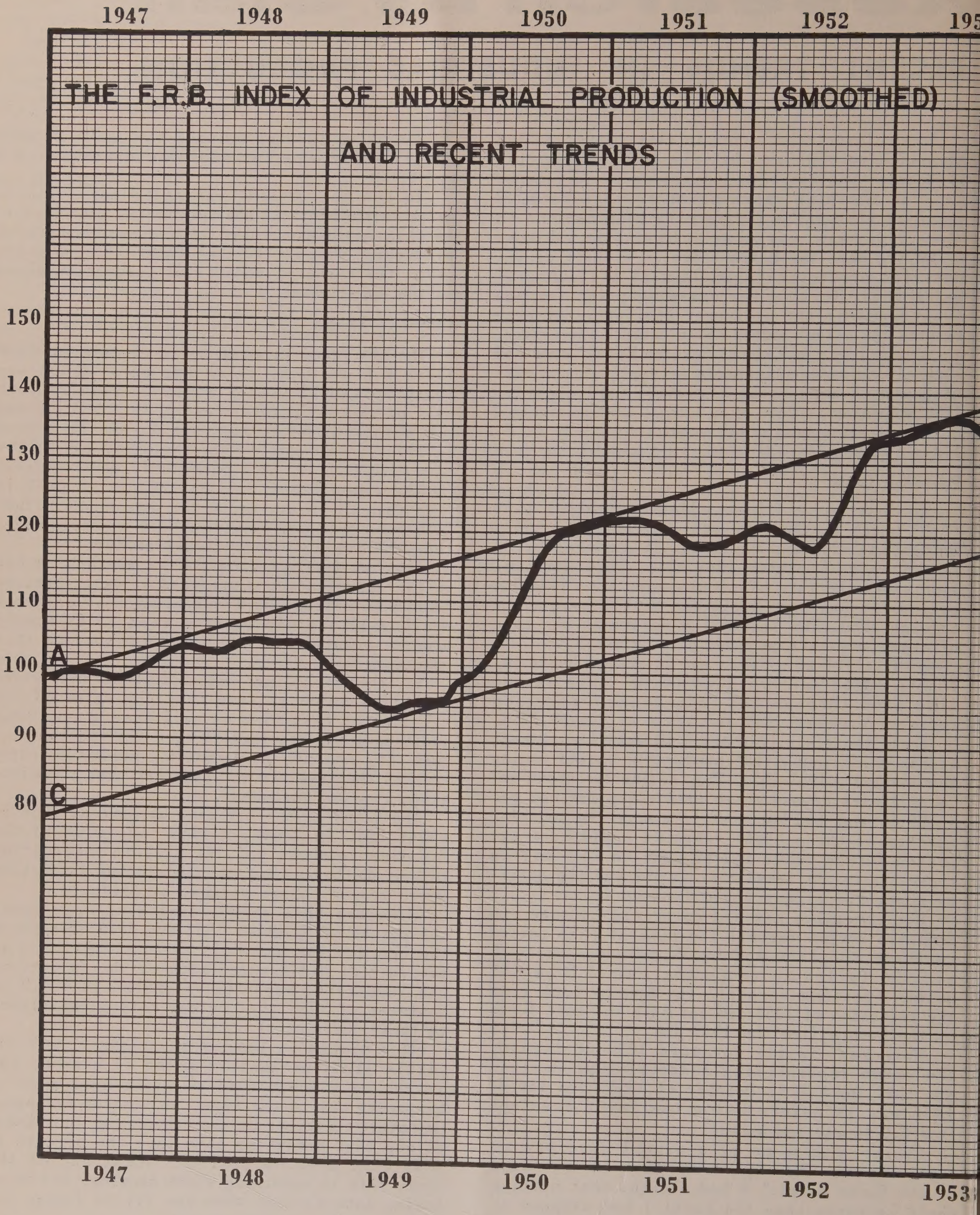
What we need to know now is whether or not we are experiencing a progressive deterioration of the situation, or a mere temporary set back which will shortly reverse itself. It should soon be possible to get a rough answer to this question.

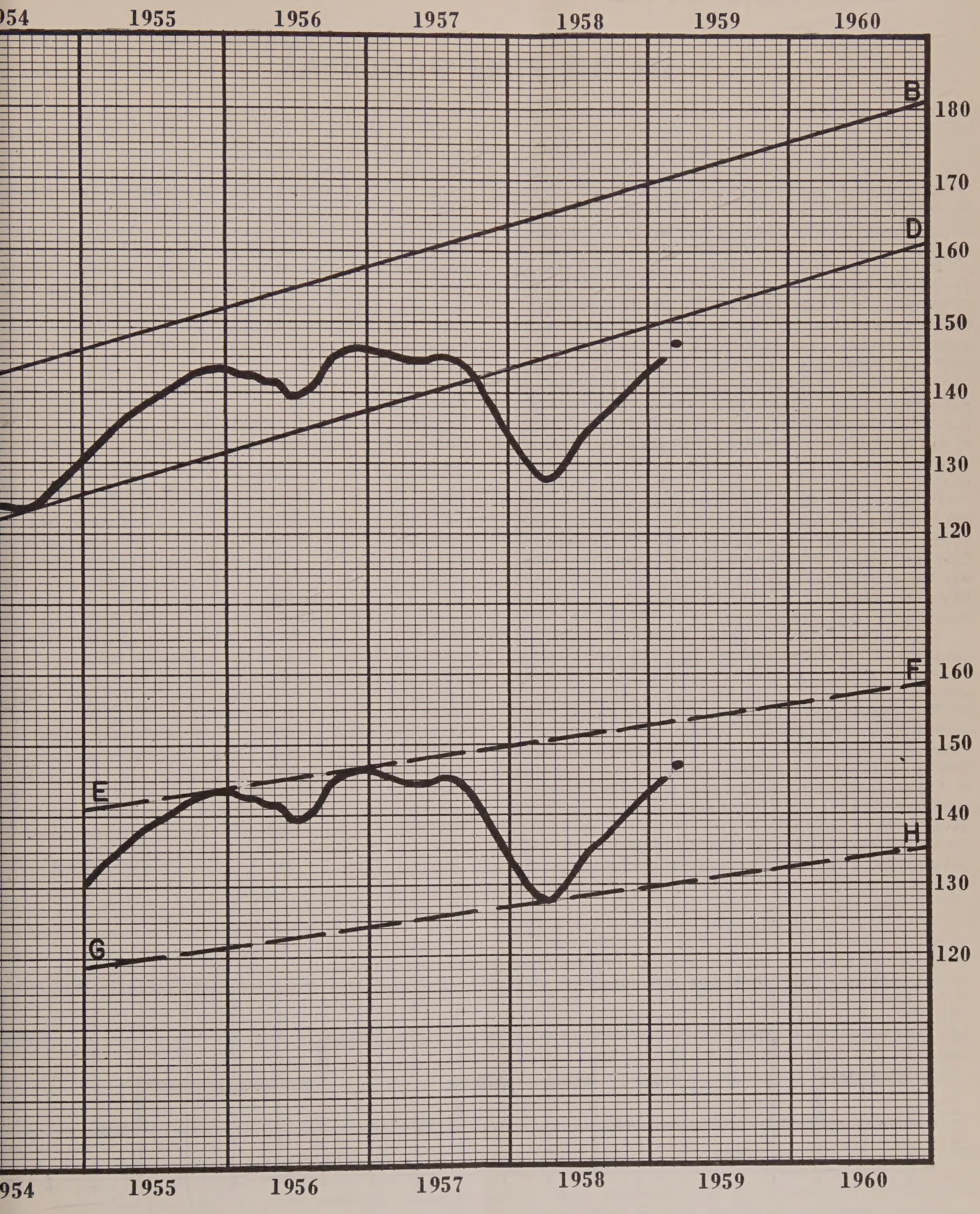
If, when we get our next industrial production peak, its value is less than the value of the E,F line at that time we will have a clue that additional adverse factors have entered the picture. If, however, the industrial production curve reaches the line, it will suggest that the situation remains unchanged.

The value of the E,F line at June of 1959 is about 154. In December 1959 the value of the E,F line is about 155. It will be interesting to see whether or not the industrial production curve reaches these values, or fails to.

Remember that there is nothing holy about the points of November 1955 and 1956 upon which the line E,F was based. It is only when there is *substantial* difference, such as the failure of the industrial curve to reach the line A,B in November of 1956 that we can attach importance to these differences.

This method of looking at things throws but little light on what is going to happen, but it throws a great deal of light upon what is happening *now*. A new boom, or a major collapse, may start tomorrow. On the other hand, our charts do say that something came into the picture in 1955 that took half of the steam out of the boom. This is something worth knowing, and worth taking into account when you try to figure out what is going to happen next.


THE F.R.B. INDEX OF INDUSTRIAL PRODUCTION (SMOOTHED)
AND RECENT TRENDS
1947
1948
1949
1950
1951
1952
1953
150
140
130
120
110
100
90
80
A
C


954
1955
1956
1957
1958
1959
1960
B
D
180
170
160
150
140
130
120
E
F
G
H
160
150
140
130
120
954
1955
1956
1957
1958
1959
1960

THE 3.67-YEAR CYCLE IN THE PINE GROSBEAK

BY G. F. SHIRK

At periodic intervals for as far back as records are available, the Lake States have enjoyed an invasion of the Pine Grosbeak, a bird which normally lives in the northern latitudes.

Details of these invasions are given in an article by Leonard W. Wing published in the Spring 1953 issue of the *Journal of Cycle Research.* Dr. Wing calls attention to the fact that this behavior tends to conform to a perfectly regular cycle of something less than 4 years in length.

It is one of the advantages of biological data that they often fall into simpler cyclic patterns than the data recording human activity. A disadvantage of biological data is that so many of them are available on merely an annual basis.

Moreover, in many instances, numerical values are lacking. We know merely that in certain years there were many Pine Grosbeaks, for example. That is, nobody counted the birds that were present at a certain place year by year. But we do have the word of ornithologists that particular years were "invasion" years.

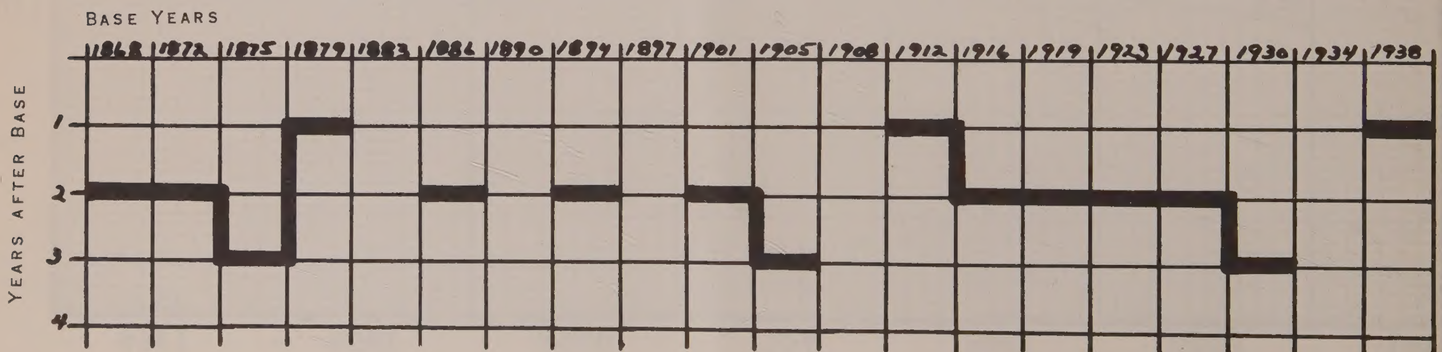
The table which follows gives the years of invasion of the Pine Grosbeak into the Lake States, together with a perfectly regular 3 2/3-year sequence.

The facts given in the table are diagrammed on the time chart at the bottom of the page. The construction of time charts is discussed on pages 133 and 134 of this issue. A perfectly regular 3 2/3-year cycle would tend to fall around a horizontal axis on the chart. This is what we have in this instance.

No one yet knows why Pine Grosbeaks behave in this manner. These invasions always come in the winter so the length 3 2/3 is only an approximation.

However, the invasions repeat so regularly that they cannot easily be the result of chance. Moreover, the fact that rhythms of about the same length have been found in other data, including economic data, suggests that the cause is external to both birds and man--that is, it is environmental.

Perfectly Regular 3 2/3-Year Cycle	Pine Grosbeak Invasion Years	Comments
1870	1870	On time
1873 2/3	1874	1/3 year late
1877 1/3	1878	2/3 year late
1881	1880	1 year early
1884 2/3	---	No data
1888 1/3	1888	1/3 year early
1892	---	No data
1895 2/3	1896	1/3 year late
1899 1/3	---	No data
1903	1903	On time
1906 2/3	1908	1 1/3 years late
1910 1/3	---	No data
1914	1913	1 year early
1917 2/3	1918	1/3 year late
1921 1/3	1921	1/3 year early
1925	1925	On time
1928 2/3	1929	1/3 year late
1932 1/3	1933	2/3 year late
1936	---	No data
1939 2/3	1939	2/3 year early



Invasions of Pine Grosbeak into the Lake States

CYCLES, THE SCIENCE

PART I: THE HYPOTHESIS

BY EDWARD R. DEWEY

Science consists, in part at least, in the collection of *facts* and in their orderly *arrangement*. The purpose of this activity is to learn *laws*, so that we may know more of *how* the universe operates, and thus be able to *predict*.

In collecting facts the scientist normally has some hypothesis, or basic supposition, he wishes to explore. The mere gathering of facts is not science. For example, I could spend my whole lifetime measuring and recording the lengths of all the blades of grass in my back yard. By itself this would not be science. Similarly, the mere measurement of cycle lengths is not science. To be dignified by the name of science such an activity must be shaped by some underlying hypothesis.

It should be clear from our reports what our hypothesis is, but I don't know that I have ever stated it in so many words.

Hypothesis vs. Theory

One reason for my reluctance to state our hypothesis is that people tend to confuse the word *hypothesis* with the word *theory*. A hypothesis is a tentative supposition provisionally adopted to explain certain facts and to guide in the investigation of others. A theory, on the other hand, is a more or less plausable or scientifically acceptable general principle offered to explain phenomena. You see, a hypothesis is much less definite than a theory. A hypothesis is a frame of reference within which to explore. A theory is a set of principles to defend. A hypothesis may depend on hunch or intuition, and often does. It can be discussed, but it cannot properly be argued. A theory on the other hand has been crystalized to the point that it can be argued—and, in its initial stages, usually is!

Two Examples

Let me give you a concrete example. Imagine a primitive fishing village at a location where the tides are very weak—so weak in fact that they are often obscured by off-shore or on-shore winds. The prevalent *theory* of the inhabitants might be that the ups and downs of the water level were solely the result of the winds blowing water in from the ocean, or the reverse. Someone, however, might advance the *hypothesis* that there was some hidden element in the situation that might also have something to do with the ebb and flow. After study he might advance the *theory* that the water was alternately raised and lowered by the gravational effect of the moon.

If this example seems too simple—but sometime in the past it must have been a real one—let me give one that is slightly more complex. Imagine that our sky were always cloudy so that no one could ever see the moon. Imagine further that, like Jupiter for instance, we had several moons. The hypothesis or supposition that "something out there" caused many of the ups and downs of the water might have quite a struggle against entrenched ideas to the contrary. And, in the absence of long series of figures it might be quite a job to construct a workable *theory*.

Our Hypothesis

We are in much this same situation in respect to cycles. We have a *hypothesis*, we do not yet have a *theory*. Our hypothesis is akin to that of the fisherman just spoken of. The evidence suggests that there is "something out there" that tends to *force* animal life, plant life, and weather into rhythmic patterns. We hope that, by learning *enough* about rhythmic patterns, we can deduce what this "something out there" is—or at least learn enough about it to formulate a *theory*.

Our hypothesis is that "something out there" causes tides in the affairs of men (and plants and animals and weather) just as the moon causes tides in the waters of the ocean. We don't yet know what this something is. Probably the most we can say is that the evidence, viewed impartially, is that there is *something*, and that further research in this area is likely to prove fruitful.

Reasons that Justify It

The reason I say that there is an unknown something is because (1) many of the observed rhythms repeat many, many times, (2) many of them continue over very long periods of time—hundreds, even thousands of years, (3) many rhythms in social science data often have the same wave length as rhythms in natural science data (thus suggesting something common to both), (4) rhythms having the same wave length tend to come at about the same time, when observed at the same latitude, (5) rhythms, when distorted, tend to return to the old patterns (which they would not do unless forced), (6) rhythm lengths tend to bear simple harmonic relationships to each other, (7) rhythms evidence latitudinal passage—that is, they crest later and later as they are observed nearer and nearer the equator, and (9) latitudinal passage, like magnetic declination, evidences land-mass distortion. None of these behaviors is likely to come about as a result of chance. That all combined could be the result of chance is almost inconceivable.

What Is the Something?

What could the "something out there" be that causes the tides in the affairs of men?

This subject will be discussed in the next installment of this series of articles.

Research by Others

DUNBAR'S 46-MONTH STOCK PRICE CYCLE

BY G. SHIRK

The Dunbar 46-month cycle in common stock prices has come true again. The 1957 low point was the fourth turn that the cycle has correctly predicted since 1952, when we first told you about it. It is the sixth turn that has come true since Dunbar first discovered it.

Veryl L. Dunbar first wrote about the 46-month cycle in an article in *Barron's*. June 30, 1952. We discussed it in 1952 and again in 1956.

This cycle operates in a simple manner. The low in a year of low is below the high in the preceding year of high, and the high in the year of high is above the low in the year of the previous low. (Dunbar uses the Axe-Houghton Index which behaves much like the Dow-Jones Industrials.)

In 1952 the cycle called for a high in that year that would be above the low of the previous year of low, which was 1949. This happened.

The 1953 low was then to be below the high of 1952. This happened.

The next high in the cycle was the year 1956. The high of 1956 was supposed to be above the low of 1953. This happened.

The low of 1957 was then to be below the high of 1956. This happened.

Four times out of the four possibilities that you knew of in advance, Mr. Dunbar has scored a hit. He is batting 1.000 up to now.

At the present time the forecast based on this cycle is that 1960 will see a high which will be higher than the low of 1957. Even if the next high does not come as predicted, Mr. Dunbar will still be batting .800, which is good in any league.

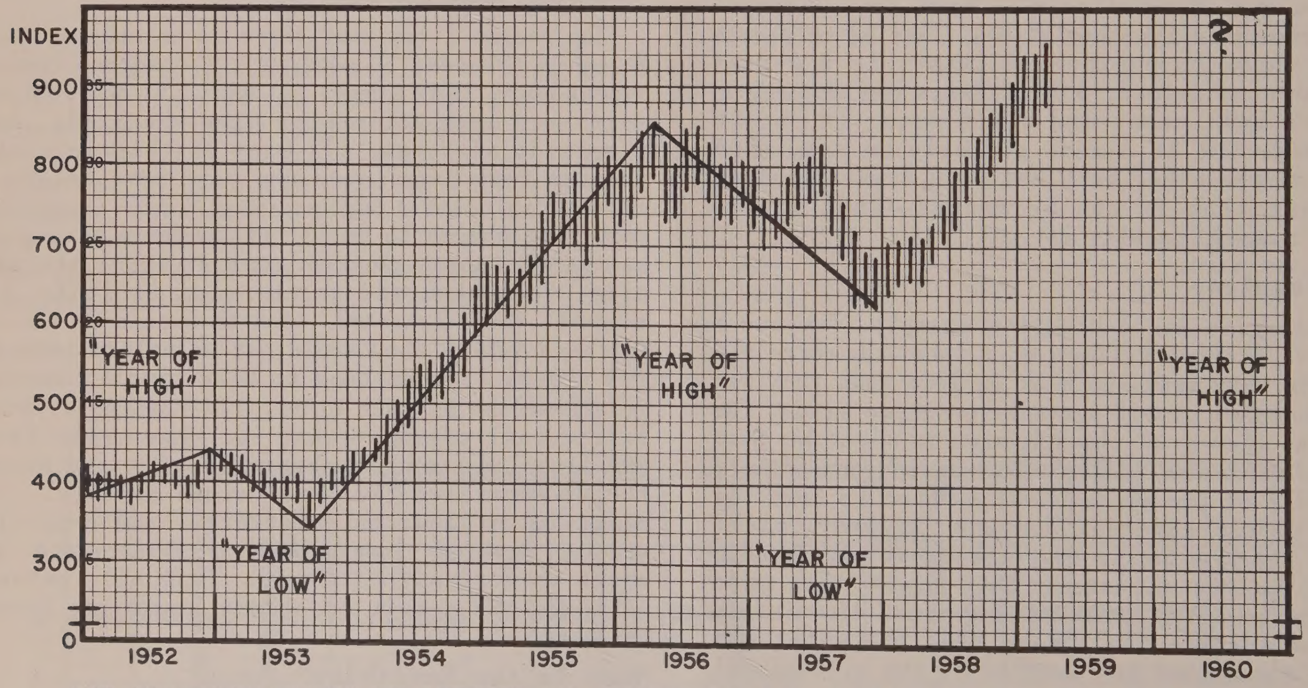
The chart below records the cycle as it has developed since 1952.

The record of this cycle over the entire period it was studied is equally phenomenal. Since 1834, there have been 64 turning points according to the rigid cycle pattern. Of these, 62 actuals have fit the pattern.

The complete record of the performance of the cycles since 1834 is given on the next page. The table is the same as was used in the original article except that we have added the figures beginning with the 1952 top.

Since 1834 only two highs have failed to be above the previous low. Even more remarkable is the fact that in every case the index was lower in the year of the cycle low than in the previous year of high.

Although the record of the cycle prior to 1952 is excellent, the fact that it has come true since discovery gives it even more significance. Certainly it is a factor which should not be ignored.



AXE-HOUGHTON INDEX OF INDUSTRIAL STOCK PRICES, JANUARY 1952 — MARCH 1959

"Years of High" and "Years of Low" according to Dunbar's 46-month cycle are indicated. A line diagrams the course of the cycle between the highs and the lows. The Axe-Houghton Index behaves similarly to the Dow-Jones Industrials.

TABLE 1

The 46-Month Cycle in Common Stock Prices 1834--1959

by Veryl L. Dunbar

A. Years of cycle low according to the pattern 3-4-4-4-4-4 and repeat, and the index of common stock prices for the years of low.

B. Years of cycle high according to the pattern 3-4-4-4-4-4 and repeat, and the index of common stock prices for the years of high.

C. Percent appreciation, low to high.

D. Percent depreciation, high to low.

Common stock prices are the Axe-Houghton Index of Industrial Stock Prices for the years 1883 to date carried back to 1854 by Clement and Burgess and connected with an index of stock prices from the year 1834 as published in a *Review of Economic Statistics*. The index shown for each year is the high or low index for the month in which the high or low occurred in that particular year.*

A		B		C	D
Cycle Low		Cycle High		% Appreciation	% Depreciation
Year	Index	Year	Index	Low to High	High to Low
1834	17.2	1837	22.0	27.9	37.7
1838	13.7	1841	12.2	(1.1)	38.5
1842	7.5	1845	17.5	133.3	5.7
1846	16.5	1849	19.0	15.2	6.8
1850	17.7	1853	27.0	52.5	40.0
1854	16.2	1856	21.2	30.9	57.1
1857	9.1	1860	19.0	108.8	36.3
1861	12.1	1864	37.5	209.9	37.1
1865	23.6	1868	39.7	68.2	20.4
1869	31.6	1872	46.8	48.1	42.7
1873	26.8	1876	39.6	47.8	36.4
1877	25.2	1879	49.0	94.4	12.2
1880	43.0	1883	59.4	38.1	45.1
1884	32.6	1887	73.6	125.8	19.6
1888	59.2	1891	78.4	32.4	6.4
1892	73.4	1895	70.0	(4.6)	37.1
1896	44.0	1899	94.8	115.5	30.8
1900	65.6	1902	102.4	56.1	35.0
1903	66.6	1906	135.4	103.3	46.5
1907	72.4	1910	131.8	82.0	30.0
1911	92.2	1914	111.6	21.0	14.2
1915	95.8	1918	162.5	69.6	14.0
1919	139.7	1922	160.4	14.8	19.8
1923	128.6	1925	198.6	54.4	25.2
1926	148.5	1929	428.8	188.8	64.1
1930	153.8	1933	154.2	0.3	26.9
1934	112.7	1937	293.4	160.3	57.5
1938	124.8	1941	170.0	36.2	29.4
1942	120.0	1945	280.4	133.7	21.4
1946	220.4	1948	283.0	28.4	24.7
1949	213.0	1952	440.4	106.8	17.1
1953	365.0	1956	856.8	134.7	27.3
1957	623.0	1960	?		
1961	?	1964	?		
		TOTAL		2,333.5	963.0
		AVERAGE		72.9	30.1

*FIGURES 1834 THROUGH 1949 FROM THE BULL MARKET BY VERYL L. DUNBAR AS PUBLISHED IN BARRON'S FOR JUNE 30, 1952, PAGES 11 AND 12. FIGURES AFTER 1953 ADDED BY FOUNDATION.

( ) DENOTES DECREASE

CYCLES OF THE FIDDLER CRAB

BY G. F. SHIRK

At daybreak a fiddler crab begins to darken so that by noon, when it is the darkest, it blends well with its environment and is neatly protected from the sun and its natural enemies. By midnight, the fiddler crab is again pale and silvery. The crab makes this physical adaptation to its changing environment in a rhythmic cycle 24 hours long.

Biological Clocks

All living things exhibit rhythmic biological cycles. Biologists have long assumed that living organisms contained within themselves a "biological clock" that regulated these biological cycles, That is, the timing mechanism which controls the organism was assumed to be within the organism itself.

A different explanation is postulated by Frank A. Brown Jr., Morrison Professor of Biological Sciences at Northwestern University.

Years of research by Professor Brown and his associates indicates that in the instances they have observed, the change or modification of the organisms is in response to rhythmic forces external to the organisms. Even though the creature has the necessary inherent ability to adapt, it is the external environment which triggers some of the cycles.

Although the work is being done by these scientists with everything from fruit flies to potatoes, much of the early work was done with the fiddler crab.

Crab Color Cycle

The fiddler crab darkens and lightens its color by the movement of pigment in its cells. A method was developed to determine the stage of the pigment dispersion so that it was possible to follow the constant pigment change of a large group of crabs which were placed in a photographic darkroom.

In this light-tight room the crabs retained their usual 24-hour cycle of pigment change in phase with the outside day-night cycle. The cycle continued at 26 C, 16 C, and even 6 C.

However, it was found that when the crabs were immersed in near freezing water the cycle of color change was stopped, or greatly slowed by this severe temperature change. When warmed to room temperature again the crabs resumed their daily rhythm, but at a new phase, starting up where they had left off. The cycle again continued but re-set in phase according to the length of the time of the immersion.

The biological clock, it was found, could also be re-set by illumination out of phase with the actual day-night cycle. The new phase would be according to the spurious illumination, but the cycle would still be a 24-hour cycle. In fact, it developed that the clock could be set to any phase, but the 24-hour cycle length would not be changed.

When the researchers tried to impose a 32-hour cycle of color change, they got a 96-hour cycle (the least common multiple of 32 and 24) of color change in the crabs until when returned to total darkness, they resumed the normal 24-hour rhythm.

When a batch of crabs which were changing color according to the actual dawn to dusk cycle at Cape Cod, Massachusetts, were flown in darkness to California, they continued to change color according to Eastern Standerd Time as long as they were kept in darkness and were not exposed to the different timing of night and day in California.

In his article, "The Rhythmic Nature of Animals and Plants", which appeared in the Fall 1958 issue of the *Northwestern University Tri-Quarterly*, Brown points out that people who travel from east to west via plane find they have to re-set their own "biological clocks" which control wakefulness and sleepiness according to Pacific Standard Time. To re-set their clocks, the crabs needed exposure to the California sun.

Other Crab Cycles

In addition to the daily cycle of color change with the timing set by the environment, the fiddler crab was found to have a secondary cycle of response to the tides. At 15 day intervals the degree of darkening of the crab is greater than at other times, and these extra-dark times correspond to the lunar and tidal cycles of the crabs external environment.

The crabs also exhibit lunar-tidal cycles of running activity. As the study of crabs (and other creatures such as oysters and quahogs) broadened in scope it also deepened in perspective.

For instance, a method was developed for measuring the oxygen consumption of the crab. It was found that when the color-changing clock was re-set, the imposed oxygen consumption clock was *not* changed, but continued to respond directly to the outside factors, such as barometric pressure.

Professor Brown likens this to the factory worker who, in changing from the day to the night shift does so without re-setting his watch. In the crab the color-change clock would work in any relationship to the metabolic clock. Whatever internal clock the crab possesses appears to cooperate with all the external clocks to which the crab is exposed in order that the creature makes the best possible adaption to a hostile world.

The Cycle Workshop

HOW TO GET HINTS OF CYCLES—THE TIME CHART

BY E. R. DEWEY

There are six simple ways to get hints of rhythmic cycles. Inspection, the laying on of pencils, and "thumbing" were discussed in *Cycles* for January 1958; "counting" was discussed in April 1958; graduated scales were discussed in July 1958. This article will discuss time charts.

A time chart is merely a grid upon which the successive highs (and lows) of a rhythmic cycle may be plotted to show the length of the cycle, and its variability.

For illustration, let us make a 12-month time chart of the temperature highs at San Francisco for the period January 1931, through December 1940. These highs fell as follows: In 1931 and 1932 in September; in 1933 in October; in 1934 in September; in 1935 in June; in 1936 in September; in 1937 and 1938 in October; in 1939 and 1940 in September. The time chart is shown as Fig. 1.

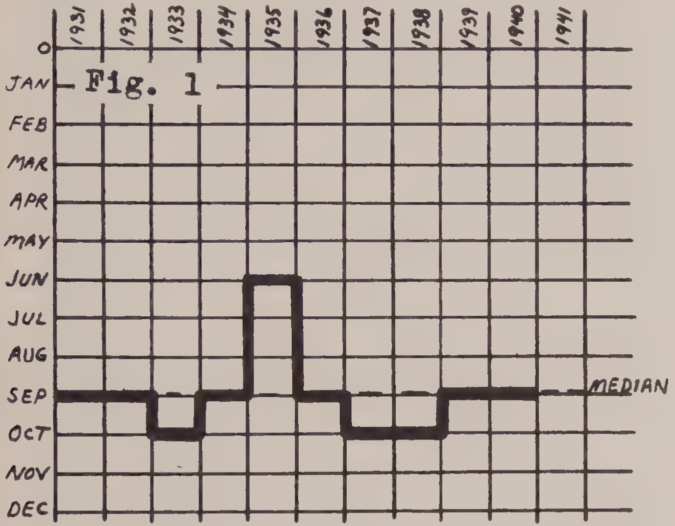


Fig. 1

Each column of the time chart represents time. In a 12-month time chart each column represents time that is 12 months later than the time represented by the column before.

To make the time chart of San Francisco temperature highs you place a heavy horizontal line in the 1931 column of the grid at September, because, as stated above, September was the high for that year. You do the same for September 1932. In the 1933 column you place your heavy horizontal line at October. You proceed this way for all your high points. To help the eye we now connect these horizontal lines by vertical lines. Your time chart is now completed.

It is obvious that, if the cycle is 12 months long, the bars will tend to oscillate above and below a horizontal line at median position.

Let us now draw the same time chart on a generalized grid. Instead of using each column to represent years as such, and each line to represent months as such, let us assign numbers to each consecutive month and establish base numbers for each column. We shall call December 1900 month zero. This scheme will make December 1901 month number 12, December 1930 month number 360 (30 x 12).

Here is a table of month numbers for the period under discussion.

The warmest months of the years 1931-1940 in in San Francisco would thus have the following month numbers:

Month	Year	Month Number	Month	Year	Month Number
September,	1931	369	September,	1936	429
September,	1932	381	October,	1937	442
October,	1933	394	October,	1938	454
September,	1934	405	September,	1939	465
June,	1935	414	September,	1940	477

This numbering system would make the base number of our first column 360. The position 1 in the first column would represent 1 month after the base, or January 1931 as before. Our new grid and our new time chart are shown in Fig. 2.

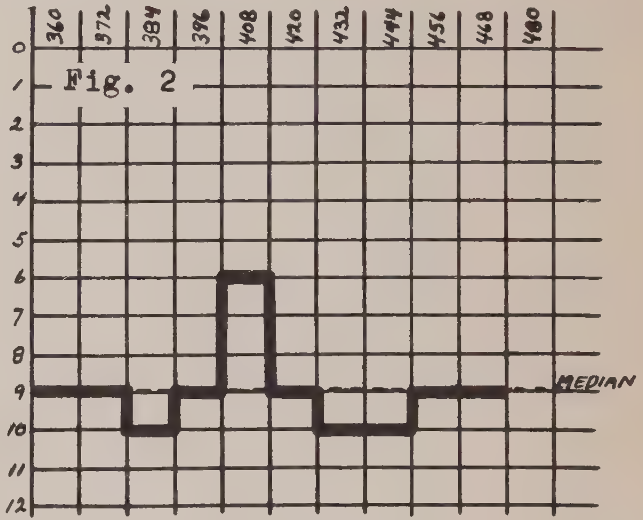


Fig. 2

Note that, because this is a 12-month time chart, each base number is 12 larger than the one before. Note that, because September 1931 is 9 months after base that the bar which shows that this is the month of high is entered just as before on the 9th line from the top, and so on. We have merely exchanged numbers for months, base months for years. Note that the last line of any column of the grid represents the same month as the first (base) line of the next column.

Note also that, although each column as drawn represents only 12 months of time, it could be extended indefinitely forward and backward. The time chart repeated with the grid extended backward to six months before base and forward to 24 months after base is shown in Fig. 3. It is still a 12-

month time chart, because the base numbers are 12 months apart.

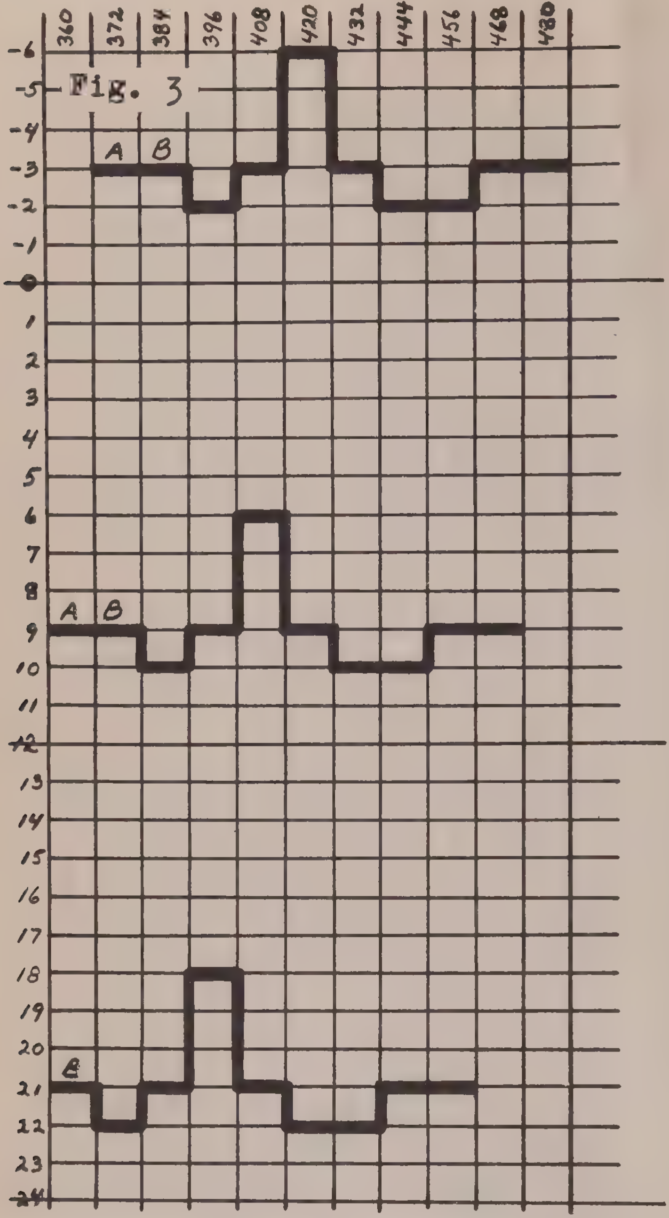


Fig. 3

The first bar in the original time chart, at September 1931 at position 369 (9 months after the first base number, 360) can also be plotted in the second column at position 369 which, in this case, would be 3 months before the second base number, 372. This has been done, both bars being marked A.

Similarly the high of September 1932 can be plotted as 9 months after base 372, or 21 months after base 360, or 3 months before base 384. All these plottings represent the same point in time; all these have been made; all are labeled B.

Only one other thing needs to be noted: If the length of the time chart and the length of the cycle are not the same, the axis around which the bars oscillate will not be horizontal, but will slope up or down depending on whether the cycle is shorter than the time chart or longer. For example, let us plot our 12-month San Francisco temperature cycle upon an 11-month time chart grid. The successive base numbers are 11 months apart; the grid is 11 months long; the time chart would look like the one shown in Fig. 4.

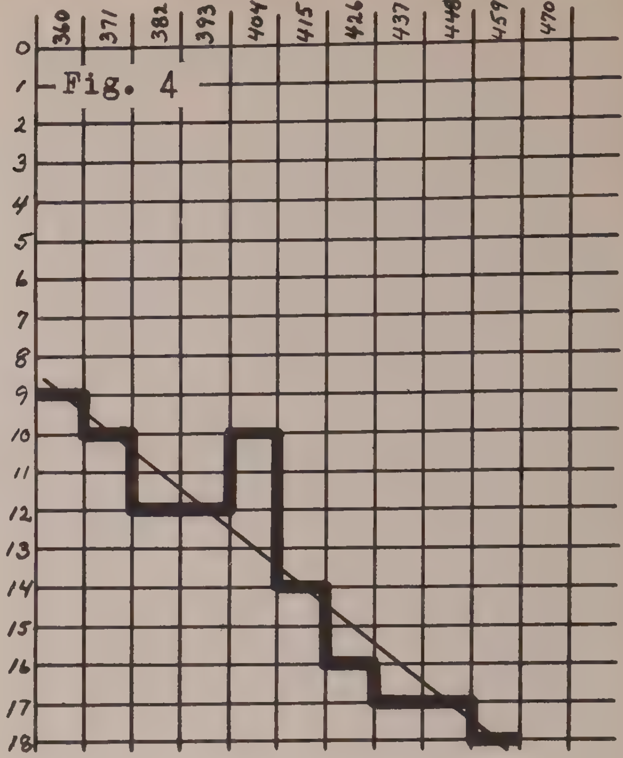


Fig. 4

On a 13-month time chart grid our 12-month temperature cycle would have looked like Fig. 5.

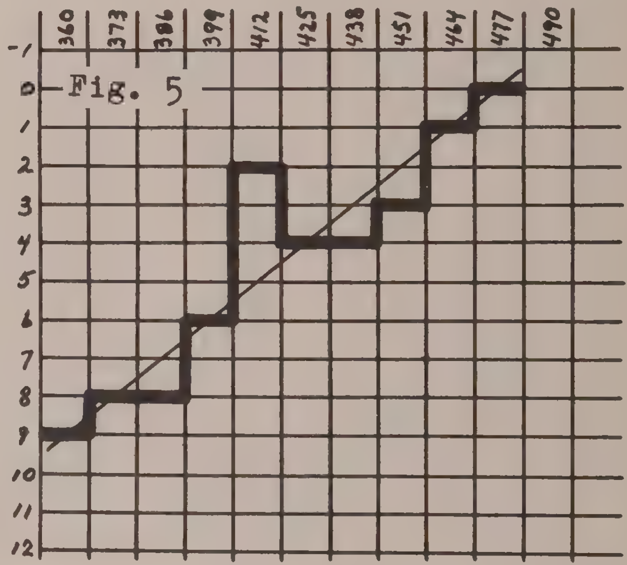


Fig. 5

It thus becomes clear that, from the slope of the line established by the bars of a time chart, one can compute the length of the cycle with great accuracy. Also, by seeing if the slope of this line changes, one can see instantly if the length of the cycle changes, and, if so, by how much.

Ordinarily you plot lows as well as highs.

Further details in regard to the time chart are available in the literature.

Library Additions

EMOTIONS

Zest For Work by Rexford Hersey. Harpers and Brothers, New York, 1955.

Rexford Hersey is Associate Professor of Industry, Wharton School of Finance and Commerce, University of Pennsylvania. In this book, which is subtitled *Industry Rediscovers the Individual*, Hersey reports on studies made of individuals working in industrial plants with respect to the quality of their work, and the reasons for good or poor job adjustment. Of particular interest is the section on the impact of the individuals emotional cycle on his ability to meet and overcome work problems.

ANIMALS AND PLANTS

"The Rhythmic Nature of Animals and Plants", by Frank A. Brown, Jr. An article published in the *Northwestern University Tri-Quarterly*, Vol. 1, No. 1, Fall, 1958.

A review of the results obtained in various experiments in the research program on rhythmicity conducted at Northwestern University, Woods Hole, Massachusetts, and other places.

"Comparisons of Some Fluctuations in Cosmic Radiation and in Organismic Activity During 1954, 1955 and 1956," by F. A. Brown, Jr., H. M. Webb and M. F. Bennett. An article reprinted from the *American Journal of Physiology*, Vol. 195, No. 1, October, 1958.

A report on the average solar-day and lunar-day fluctuations in the consumption of O_2, or in spontaneous motor activity, of eight species of animals and plants for a total of 20 monthly periods. These are compared with concurrent fluctuations in cosmic radiation. Striking similarities were evident in every instance in either direct or mirror-image relationship.

The eight species were fiddler crabs, potatoes, carrots, sea-weed, quahogs, salamanders, oysters, and rats.

"The Rhythmic Nature of Life" by Frank A. Brown, Jr. An article reprinted from *Recent Advances in Invertebrate Physiology*. University of Oregon Publications, 1957.

In this article Professor Brown reviews the evidence of daily, tidal, monthly and annual rhythms in living organisms, particularly the fiddler crab. Brown concludes, "The evidence suggests that these two kinds of clocks, internal and imposed, normally work hand in hand in living animals and plants to help assure that they time their multifold activities to permit them to live successfully in their essentially hostile, rhythmic environment."

POTATOES

"Monthly Cycles in an Organism in Constant Conditions during 1956 and 1957" by Frank A. Brown, Jr., M. F. Bennett, and H. M. Webb. An article reprinted from the *Proceedings of the National Academy of Sciences*, Vol. 44, No. 4, April 1958.

In the experiment reported in this paper, potatoes were kept in constant conditions, including pressure, in automatic, continuous recording respirometers for 13 months in 1956 and 1957.

The report concludes, that organisms, even in constant conditions, "are deriving cycles of the natural geophysical frequencies from the external environment. These, it is postulated, they use in the maintenance of highly labile, non-phase-locked, more or less frequency-precise cycles of their numerous biological activities."

"An Exogenous Reference-Clock for Persistent, Temperature-Independent, Labile, Biological Rhythms" by Frank A. Brown, Jr. An article reprinted from *Biological Bulletin*, Vol. 115, No. 1, August 1958.

The oxygen consumption of potatoes in constant conditions (including pressure) was monitored almost continuously for more than two years. The results of the experiment, the conclusions reached, and the additional problems are discussed in this paper.

TEXTILES

Cycles and Trends in Textiles by Thomas Jeff Davis, Textiles and Clothing Division, Business and Defense Services Administration, U. S. Department of Commerce. This publication is available for the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., for 40 cents.

In this study Davis uses the differences between centered 12-month and 24-month moving averages to isolate the 2-year cycle in textile mill activity. He worked with figures of fiber consumption by mills, and studied all fibers, and also cotton, wool, rayon and acetate, and silk separately.

Davis also devotes a section to the relation between fiber consumption and the national economy.

Letters to the Editor

CYCLES

Dear Mr. Dewey:

Although I am a stock market addict myself, I am more interested in the scientific studies of the Foundation than in its stock market analyses. It would seem to me that those whose chief concern in cycles is in connection with the stock market should take your course on how to make a cycle analysis and then make their own private charts of individual stocks—which should be all the more interesting and worth while by the very fact that they would not be public knowledge.

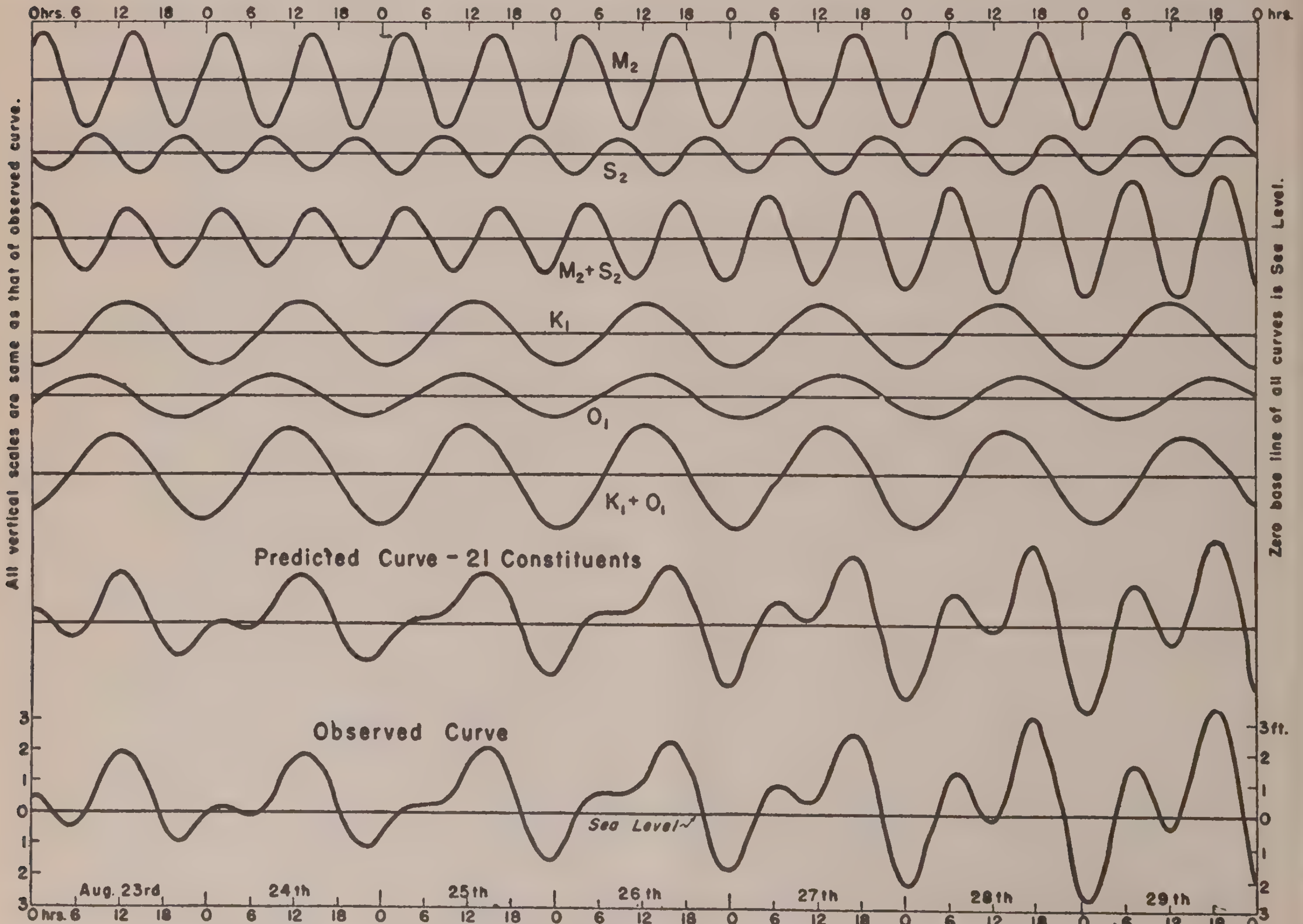
I am fascinated by the basic concept of interlocking cycles of various wave lengths and intensity all combining so as to result in an overall pattern which means little or nothing to the untrained eye. I would like to see a chart of a cycle synthesis of something such as ocean tides, where the human factor could safely be ruled out and the result could be expected to be a reasonably accurate summation of just those cycles that went into it. . I am curious about whether a recording of the wind velocity over a period of an hour or so would not again result in a picture which would make sense only on the basis of cycles.

I would like to see a list of a few basic cycle axioms which might be a guide to cycles in general. For example, in attempting a prediction on the basis of a known cycle, the factors (timing, duration, amount of fluctuation) to be considered and the relative importance of each could be summarized axiomatically.

Or, if a cycle gets off its predestined track, there exists a tendency for it to return to its original track. . .

Another point: could it be possible that the publication of a given price cycle could affect the action of that cycle?

Omaha, Nebraska Hubert A. Mc Greevy



CONSTITUENT AND PREDICTED TIDES Los Angeles, California Aug. 23—30, 1936

Comment: It is our most sincere wish to have the answers to all the questions about cycles. One of our goals is to reach the point where the knowledge about cycles can be formalized into axioms.

It is true that if *everybody* knew about a given price cycle, and *everybody* acted upon it, the cycle would be affected.

You asked for an example of cycles in tides. The chart across the bottom of page 136 gives several tidal cycles together with their combination. The actual tides are also shown as the bottom line on the chart.

This chart is from "The Prediction of Tides" by Captain Paul C. Whitney. The article was originally published by the *United States Naval Institute Proceedings,* Vol. 66, No. 12. We reprinted the article in 1940 as *Foundation Reprint No. 5.*

THE GEISINGER INDICATOR

Dear Mr. Dewey:

As a member of your Foundation, I study your report *Cycles.* Particularly, the Geisinger Indicator seems interesting. . .

However, I (would like to know) exactly, and in detail, how the indicator is computed. The detail must be sufficient that I can do the work myself if so minded. . .

The information I would like to have in this case, of course, applies to all three, the Modified Geisinger Indicator, the First Difference Indicator, and the Geisinger Indicator.

Hohokus, N. J. A. A. Mol

Comment: We appreciate your desire to know exactly how the Geisinger Indicator is computed. Unfortunately, we cannot tell you.

The Geisinger Indicator is the property of Mr. W. Robert Geisinger who will not permit us to reveal its method of computation except to say that it is based on figures published in the *Survey of Current Business,* that it is logical, and that it is purely objective.

The First Difference,Indicator, however, is in another category. It is merely the amount by which the smoothed values of the Federal Reserve Board Index of Industrial Production are above or below the smoothed values of the preceding month. The smoothing is effected by a two-month moving average posted to the second position of a three-month moving average centered.

You will find a full discussion of the First Difference Indicator on pages 77 to 83 of *Cycles* for March 1957. This discussion will show you why the First Difference Indicator has some forecasting value. In a nutshell, the First Difference Indicator measures slope and slope generally turns over ahead of the actual crest or turns up before the actual bottom.

The Modified Geisinger Indicator is merely the sum of the First Difference Indicator and the Geisinger Indicator itself.

We compute the Geisinger Indicator each month according to the formula provided by Mr. Geisinger. I can assure you that it is not something read off the ceiling, but further than this I cannot go. Mr. Geisinger will not give the information to anyone. He has refused to give the secret in confidence even to the Federal Reserve Board.

TORNADOES

A member from St. Louis, Mr. Henry W. Loehr, sent us a clipping from the St. Louis Post Dispatch which discussed the big tornado that occurred there early on the morning of February 10.

The big tornadoes have occurred at St. Louis at intervals of exactly 31 years and four months. Tornadoes struck in 1896, 1927, and 1959 at this precise time interval.

According to Edward M. Brooks, St. Louis University meteorologist, severe weather disturbances are related to activity on the sun. These three tornadoes occurred near the end of the sunspot cycle when activity on the sun was at a maximum.

If one is around in 1990 this will be an interesting coincidence to check out.

An additional note to this story is supplied by Mr. Douglas B. Houser, also of St. Louis, who says that there was another terrible tornado in St. Louis in 1833, exactly 62 yesrs and eight months prior to the one in 1896.

MANUFACTURING PRODUCTION

Dear Mr. Dewey:

In the January issue there was a study of manufacturing production, and one is disposed to take slight exception to the projected line in 1959. The actual production as shown by the heavy line shows a double top in the 1950-1952 period and another one in the 1955-1957 period, alternated by a single top in 1953.

The dip late in 1951 may have been an accumulation of inventory. The slight dip in the middle of 1956 was caused largely by the steel strike.

No one can be sure, of course, but the same thing may happen this summer, and we may get a short dip, followed by heavier production, which would give us a double top. You understand, I am not quarreling with the main thesis, only suggesting that in view of our complicated union operations, it may work out the same as three years ago.

Farmington, Michigan Ralph I. Coryell

The Cycle Round-up

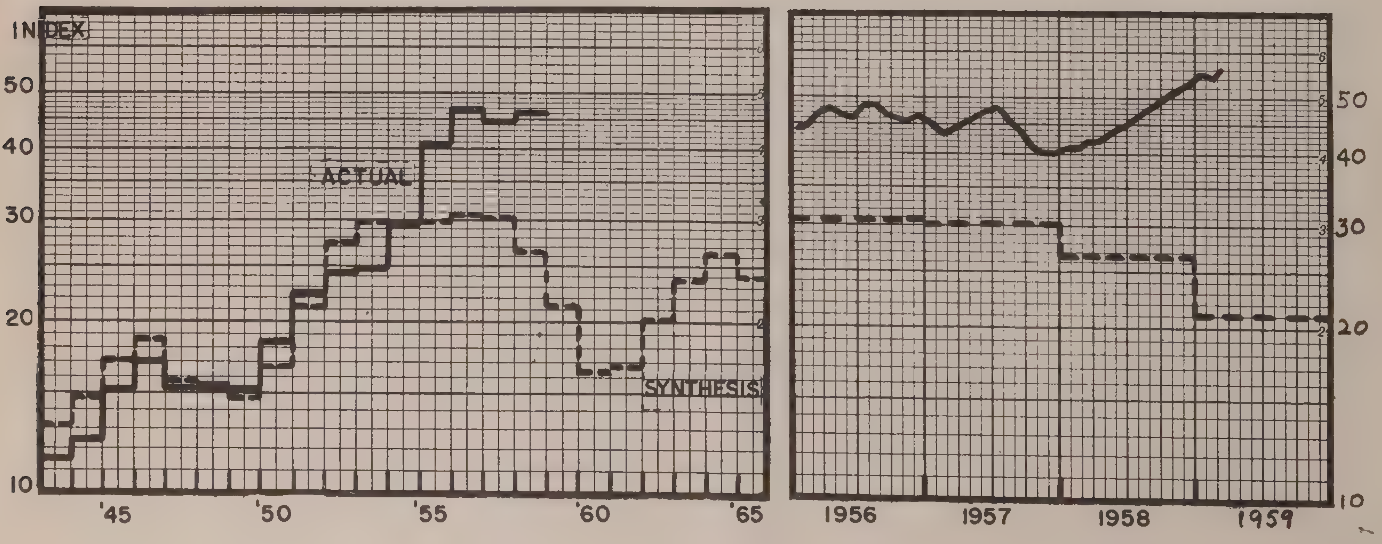
JUNE 1959

LATE FIGURES

For those of you who are following any of the series we review from time to time in this section, the recent figures are reported below.

Series	Unit	Month	Amount
Aluminum Production	Thousand tons	Jan	156.7
Automobile Factory Sales	Thousand cars	Feb Mar	477r 576p
Copper Prices—Electrolytic, New York	Cents per pound	Feb Mar	29.62 31.03
Corn Prices—#3 Yellow, Chicago	Cents per bushel	Feb Mar	117.9 120.7
Liabilities of Business Failures	Million dollars	Feb Mar	58.6 65.1
Oats Prices—#3 White, Chicago	Cents per bushel	Feb Mar	67.6 67.6
Residential Building Contracts	Million dollars	Jan Feb	1.022 1.073
Stock Prices—Standard & Poor's Combined Index	1941-43=10	Feb Mar	54.77 56.15
Sunspot Numbers	Numbers	Feb Mar	140 181
Wheat Prices—#1, Dark Northern Spring, Minneapolis	Cents per bushel	Feb Mar	222.7 221.1

STOCK PRICES



UNEMPLOYMENT

From February to March the unemployment situation improved some. On the average—based on 1948-1957 experience—unemployment as a percentage of the underlying trend goes down 7% from February to March.

This year unemployment went down 9% from February to March. The fact that unemployment went down more than would normally be expected means that the underlying trend improved.

In fact, the underlying situation has been improving since last July, which, from an employment standpoint, was the turning point in the recent recession.

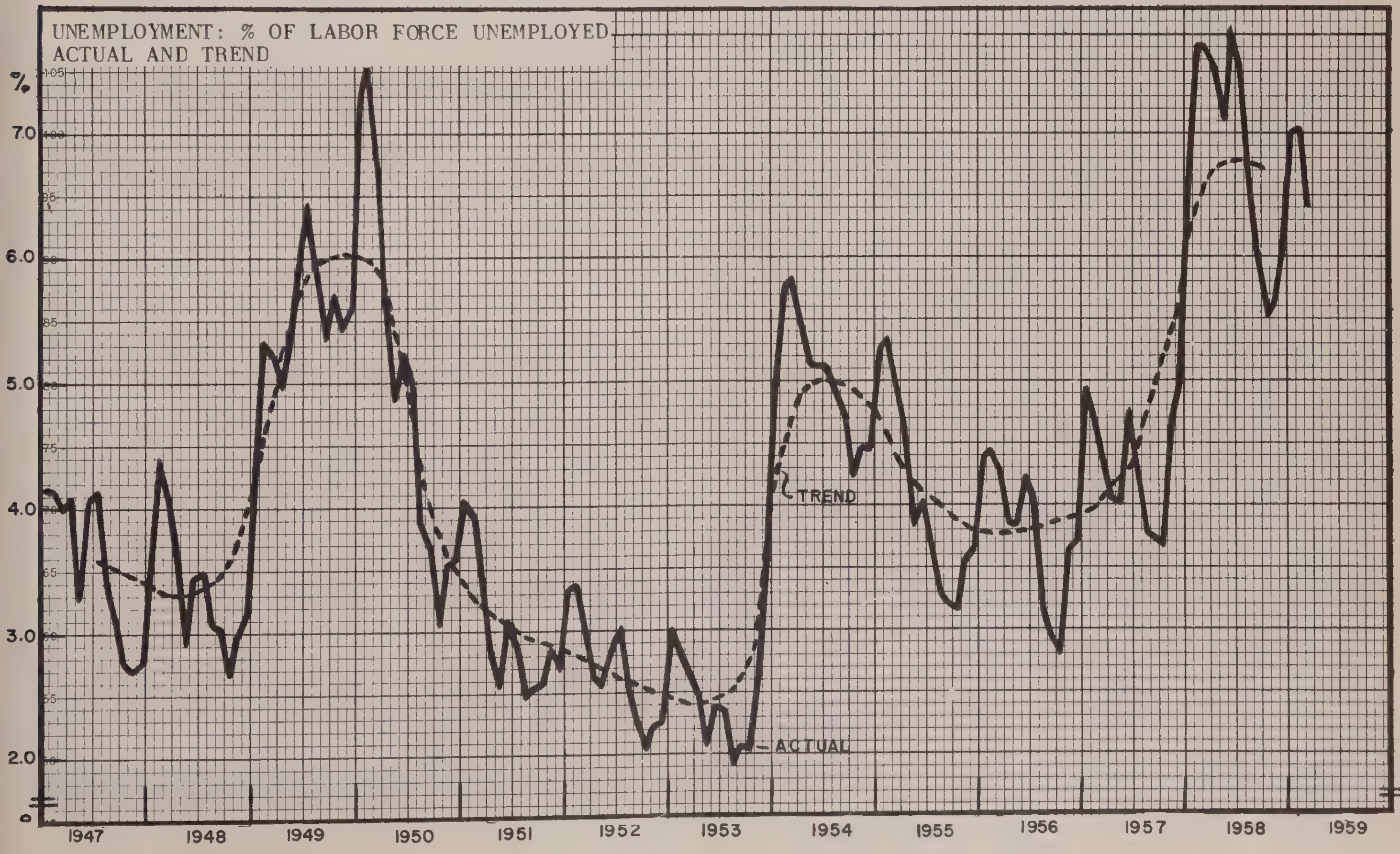
Unemployment continues high, however, and is still above both the absolute levels, and the percentage of the labor force levels which prevailed from 1951 through 1957.

The chart below shows the actual percentage of the labor force which has been unemployed since 1947 together with the underlying trend. As is apparent, the lines are moving at a higher level on the chart. In other words, the trend is at a higher level.

Our seasonal cycle is based on the percentage of trend—at whatever level trend is. When a normally expected seasonal increase is smaller than usual, there is some improvement in the situation. When a normally expected seasonal decrease is greater than usual, the situation has improved.

The table below gives the comparison between the typical to-be-expected change from month to month and the actual change from month to month. Any difference between the two is due to changes in the underlying trend.

Month	Typical Unemployment % of Trend	Typical Monthly Change	1958 Actual Per Cent Unemployed	Actual Monthly Change
1958-Mar	114	- 7	7.70	0
Apr	103	-10	7.53	- 2
May	94	- 9	7.11	- 6
Jun	106	+13	7.86	+11
Jul	95	-10	7.51	- 4
Aug	91	- 4	6.71	-11
Sep	88	- 3	5.98	-11
Oct	82	- 7	5.51	- 8
Nov	92	+12	5.60	+ 2
Dec	95	+ 3	6.03	+ 8
1959-Jan	117	+23	7.01	+16
Feb	123	+ 5	7.04	+ 0.4
Mar	114	- 7	6.40	- 9



EMPLOYMENT

The article on the preceding page deals with *unemployment*, because that is the figure always used in the newspapers. Unemployment is the figure that makes the headlines.

When *unemployment* goes *up* it's *bad*. It corresponds to other things going *down*. I find this fact confusing. Maybe you do too.

I much prefer to look at figures for employment--that is, to consider the percentage of the labor force that is *employed*. Of course a chart of percentage *employed* is the same as percentage *unemployed*, except that it is upside down. But it's easier for me to relate it to other things. Maybe it's easier for you also. Anyway, I've turned the unemployment chart upside down and have printed it below as an *employment* chart. It bears out what I said in the lead article about the upsurge in industrial production not being as great as it was.

In this connection it is interesting that the Security First National Bank of Los Angeles has just reported that newspaper help-wanted ads are a more sensitive index of business than some in general use! They found that the index based on the number of ads tends to anticipate business conditions.

In their own words, "In the 1953-54 recession the index based on the number of ads. . .led the business index by 8 months and the employment index by 13 months. . .

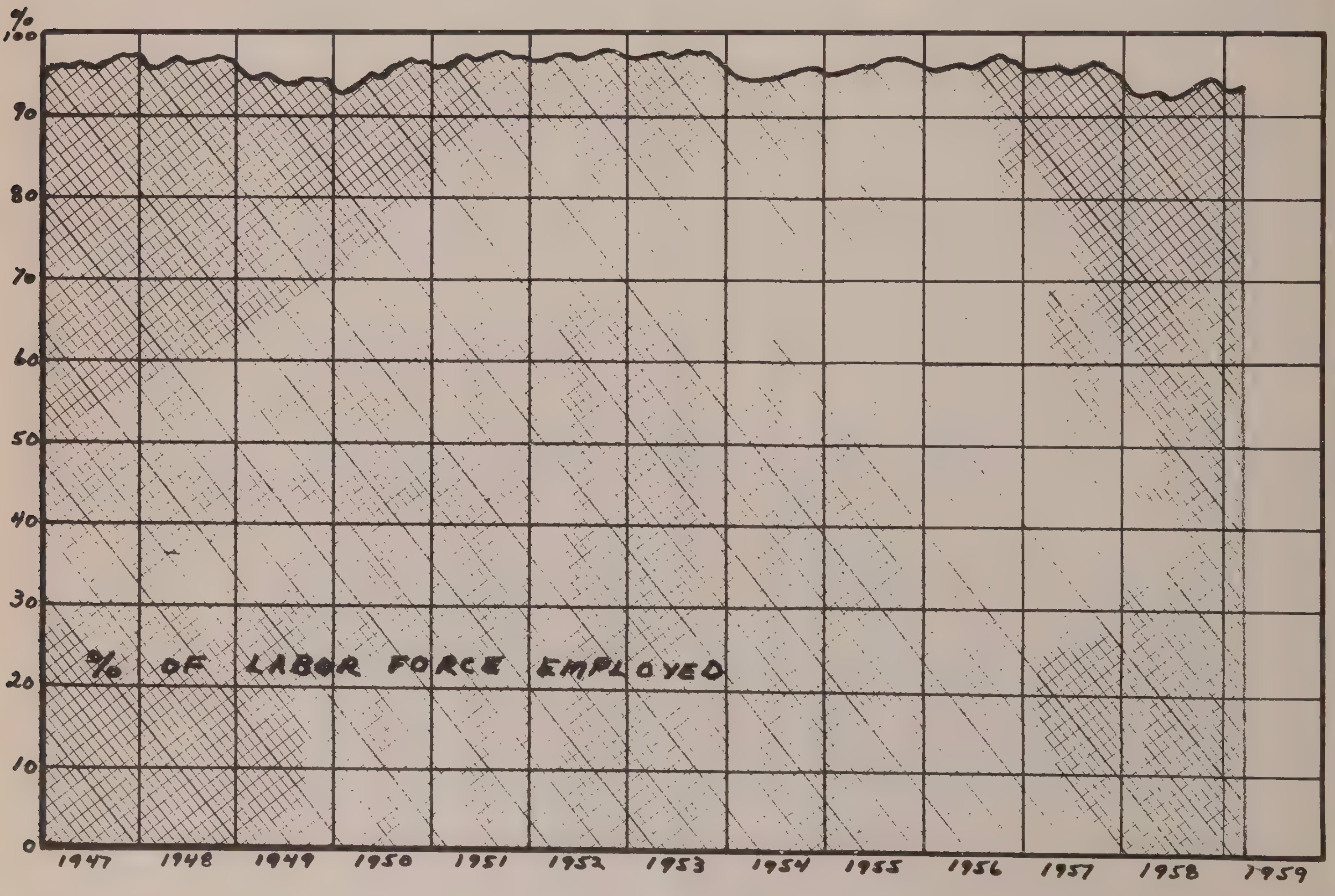
"In the 1957-58 recession the (ad) index gave ample advance indication of the downturn in business and employment. It reached a peak sixteen months before the bank's business index (although it declined only moderately during the first ten of those sixteen months). The (ad) index went into a sharp and sustained decline fully six months before the business index turned down and five months before employment turned down.

"It is noteworthy that the number of ads has shown a strong and sustained rise since its recession low, advancing for twelve consecutive months. From the February, 1958, low, the index has climbed back a little more than halfway to the all-time high recorded in 1956. . ."

Of course the above report applies only to Southern California, but it offers interesting possibilities for other parts of the country.

Employment, and its reverse, unemployment, is a very important element of our economy. I must study the cycles (other than seasonal) in them someday.

E.R.D.



The Geisinger Indicator

FORECAST

Although the Geisinger Indicator is down some from its recent high level, it is moving sideways, and does not indicate any serious drop in production in the near future. Of course this Indicator does not take into account the possibility of a steel strike.

Actual production, as measured by the Federal Reserve Board's seasonally adjusted Index, continued to climb in March, when it reached 147. The February Index was revised upward to 145 by the Federal Reserve Board.

The rate of increase in the Production Index continued steady at 1.50 in February. The rate of change in the Production Index is shown by the First Difference Indicator.

The Geisinger Indicator for December (August 1959 when advanced) was down slightly to 2.6.

The Modified Geisinger Indicator was also down slightly in December (August 1959 when advanced). In December its value was 4.27.

In so far as the contours of the Indicator lines are similar to the Index of Production line, we can expect some leveling of the Production Index. The Indicators do not at this time suggest a downturn in production.

April 22, 1959 *E. R. Dewey*

Month	F.R.B. Index	Geisinger Indicator	First Difference Indicator	Modified Geisinger Indicator	Timing Advanced 8 Months
Aug-1958	136	5.2	2.17	7.37	1959-Apr
Sep	137	3.0	1.50	4.50	May
Oct	138	2.8	1.50	4.30	Jun
Nov	141	3.2	1.66	4.86	Jul
Dec	142	2.6	1.67	4.27	Aug
Jan-1959	143	*	1.50r	*	Sep
Feb	145r	*	1.50p	*	Oct
Mar	147p	*	*	*	Nov

p - preliminary r- revised * - not yet available

BACKGROUND

The Modified Geisinger Indicator is a series of numbers which, in the past, have gone up and down ahead of corresponding movements of the Federal Reserve Board Index of Industrial Production. The Modified Geisinger Indicator thus throws some light on the probabilities of the future.

The F. R. B. Index of Industrial Production measures physical production in the U. S. A. It is a weighted average of tons, yards, gallons, and numbers of things produced each month.

The Modified Geisinger Indicator is the sum of two Indicators, the Geisinger Indicator and a First Difference Indicator.

The Geisinger Indicator was invented by Robert Geisinger. It is derived from figures which are published each month in the *Survey of Current Business*. It is charted for you as Curve A on pages 142 and 143.

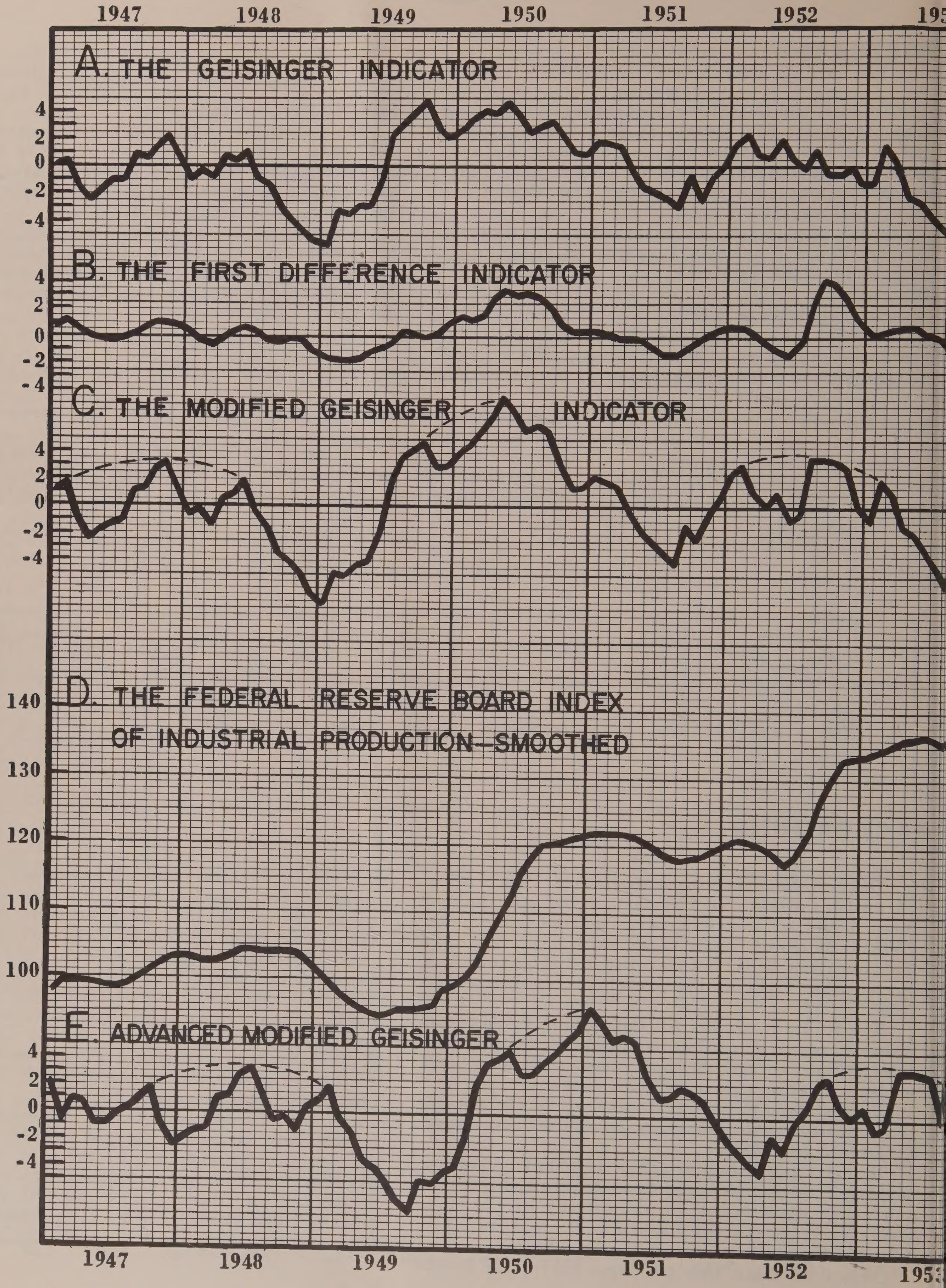
Curve B on these same two pages charts the First Difference Indicator, which is merely the amount by which the smoothed F. R. B. Index is above or below the value for the preceding month. The smoothing is effected by means of a centered 3-month moving average and a 2-month moving average posted to the second position.

Curve C charts the sum of the values of Curves A and B. This curve is called the Modified Geisinger Indicator. It suggests in a general way what the F. R. B. Index may do some eight months later.

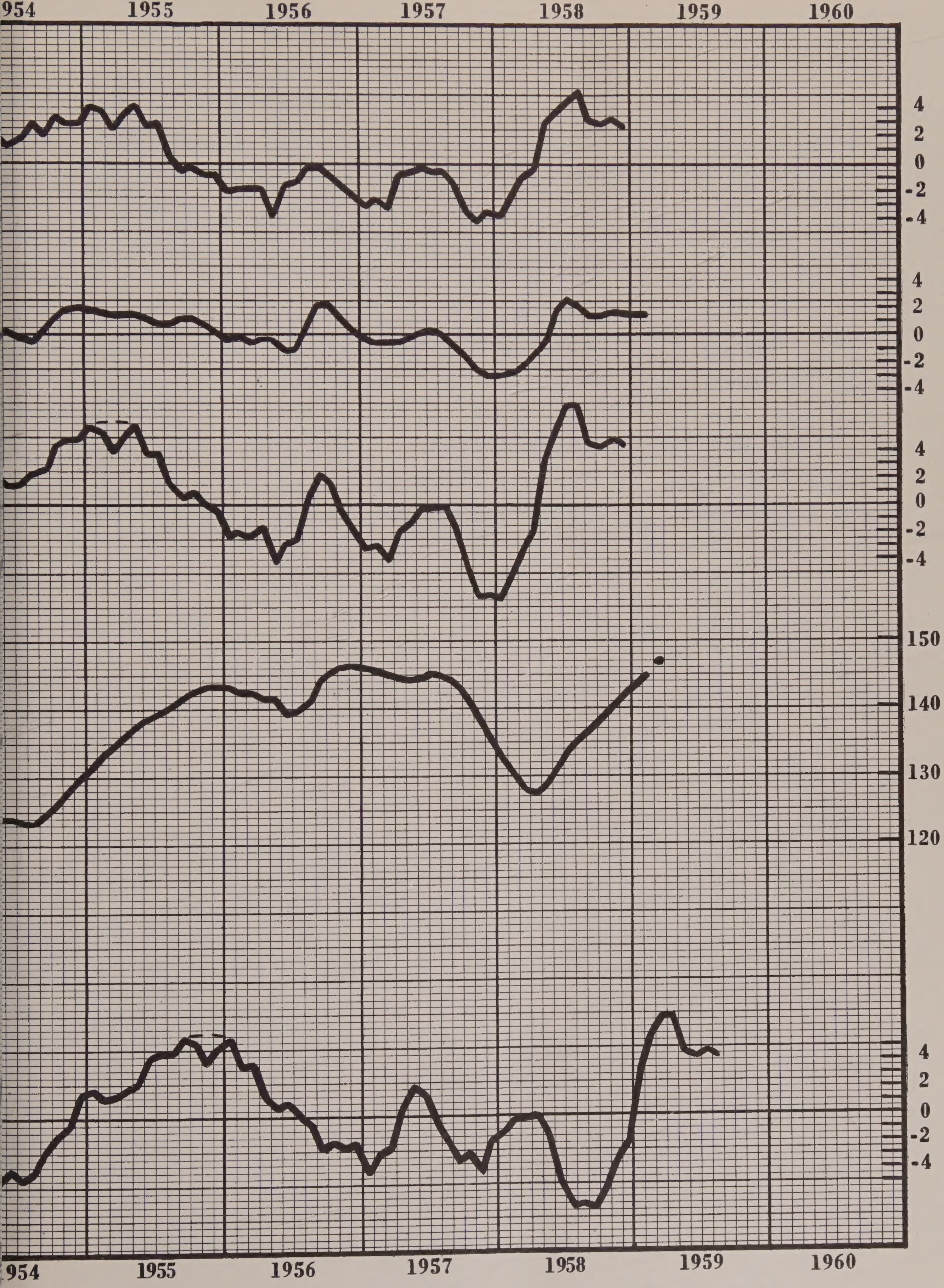
Curve D charts the values of the F. R. B. Index of Industrial Production smoothed.

Curve E re-charts Curve C, advancing it by 8 months. This advance is for two reasons (1) so that you can more easily compare the past behavior of the Modified Geisinger Indicator with the behavior of the F. R. B. Index, and (2) so that you can have a better idea of what the F. R. B. Index may do in the future.

THE GEISINGER INDICATOR



OF INDUSTRIAL PRODUCTION



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